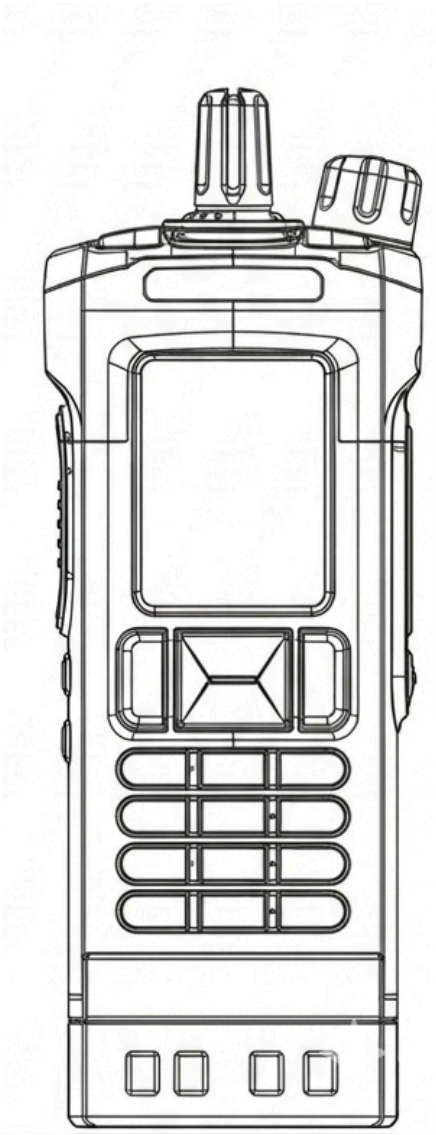
TECHNICAL MANUAL

BAOFENG DM-32UV RADIO OPERATORS HANDBOOK



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Chapter 1. Introduction and Safety

This beginner-intermediate manual provides instructions for operating the Baofeng DM-32UV radio that largely omits advanced features. The manual is based on the official Baofeng radio manual, but includes notable information about inoperable features such as long press of the P2 button, Short Message Service (SMS) bugs, and more. This manual is focused on operation in the United States of America. When operating this radio outside of the United States of America, be cognizant that there are different regulations regarding power transmission and frequency within the airspace. Seek the following resources based on the country you are operating in:

Country	Website	Country	Website
Canada	https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en	Japan	https://www.tele.soumu.go.jp/e/adm/freq/search/share/plan.htm
China	https://www.miit.gov.cn/	Mexico	https://www.gob.mx/crt
France	https://www.anfr.fr/en/plan/the-tnrbf-which-use-for-which-frequencies/acces-to-frequencies	Russia	https://grfc.ru/grfc/eng/
Germany	https://www.bundesnetzagentur.de/EN/Areas/Telecommunications/FrequencyManagement/AmateurRadio/amateurradio_node.html	UK	https://www.ofcom.org.uk/spectrum/frequencies/uk-fat

Figure 1-1. Civilian Operating Frequencies by Country

What you Need Before Starting

- ☐ Baofeng DM-32UV Radio
- ☐ Radio Antenna
- ☐ Desktop Charging Station
- ☐ USB Power Cable
- ☐ Power Brick
- ☐ Clip-on Holster

Intended Use & Warnings

The handheld radio is designed as a VHF/UHF transceiver that enables wireless transmission and reception of signals.

This radio is intended for use by properly licensed and trained operators and must be used in accordance with all FCC regulations. **DO NOT OPERATE THE DEVICE IN RESTRICTED AREAS SUCH AS AIRCRAFT, HOSPITALS, OR AREAS WITH EXPLOSIVE MATERIALS UNLESS**

AUTHORIZED. Keep the device out of reach of children and avoid unsafe operation such as operation while driving without hands-free equipment.

During transmission, the radio emits RF energy and should be used with a minimum separation of 1-2 inches (2.5-5 cm) between the antenna and body. Always ensure an antenna is properly connected before transmitting. Limit transmission duration to prevent overheating and unnecessary RF exposure, and use the lowest effective power setting whenever possible. Be aware that RF signals may cause interference with nearby electronic devices.

Use only factory Baofeng battery packs and chargers for this radio to prevent damage or safety hazards. Do not expose the battery to excessive heat, direct sunlight or open flames. Avoid puncturing or disassembling it. Charge the radio in a well-ventilated area and replace the battery if it shows signs of overheating, swelling, or damage. Additionally, do not charge the battery continuously as this will decrease the lifespan of the battery through accelerated chemical degradation. During extended operation, the radio and battery may become warm. Allow adequate cooling time and dispose of battery packs in accordance with EPA and local regulations.

Transmitting without an antenna can reflect power back into the radio and potentially damage the transmitter. This reflected energy creates a high standing wave ratio (SWR), which causes excess heat to build up in the final amplifier stage. Prolonged operation under these conditions can permanently degrade output power or cause immediate component failure.

Legal and Licensing Notes

The governing agency for radio frequencies in the United States, Federal Communications Commission (FCC), requires operators to obtain an FCC Amateur Radio Service license. For the radio's common VHF/UHF amateur-band use, a minimum of a Technician Class license is required. Additional licenses, such as General and Amateur Extra, will allow the operator to legally operate the device on more frequencies. More information is available at the FCC's website for those interested.

It's important to note that the FCC, under part 90, does not permit encryption for amateur radio transmissions. Violating the rules can result in fines, equipment seizure, or license revocation. This only applies to amateurs, as those who do possess a business license, and can operate on a business band frequency are permitted to encrypt their radio transmissions. While it is true that you can operate the handheld radio without a license in the case of an emergency, the operator will want to have the training prior to using the radio to ensure effective transmission of information.

Chapter 2. Radio Overview

General Layout

[1] - Antenna
[2] - Channel Switch
[3] - LED Status Indicator
[4] - PWR/VOL
[5] - 2" LCD Screen
[6] - PTT Button
[7] - SK1 (programmable)
[8] - SK2 (programmable)
[9] - Numeric Keys
[10] - Mic Input
[11] - Charge Contacts
[12] - Speaker
[13] - Speaker/Mic Jacks
[14] - USB Type-C Port

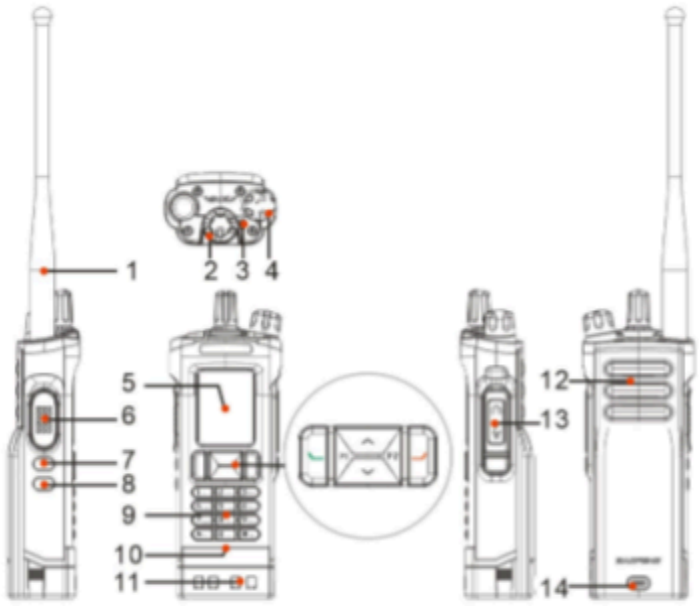


Figure 2-1. General Layout

On the top right of the screen, there will either be a DIG representing digital or ANA representing Analog

There are a total of 4 ports on the radio. As shown by Figure 2-1, 1 represents the antenna port. 14 represents the Type-C charging port, and 13 represents the audio and headphone port. It is important to keep these ports protected to shorting of components.

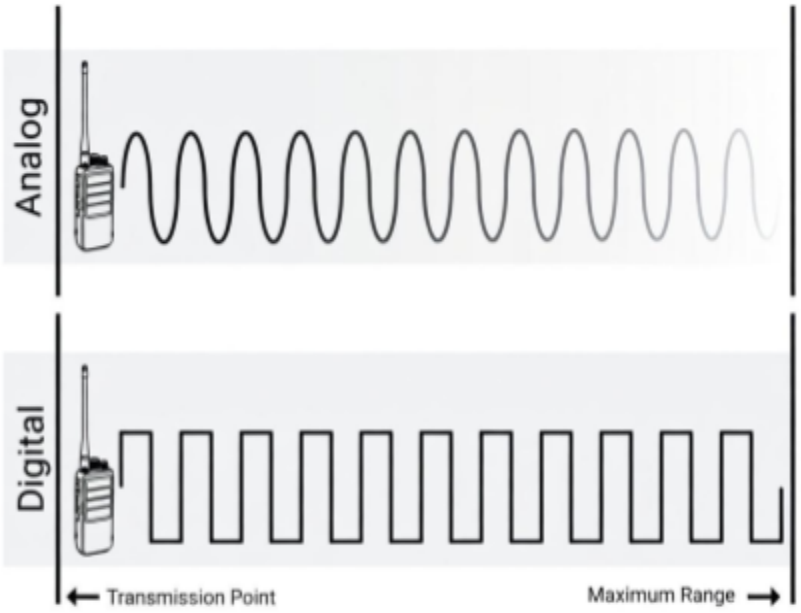


Figure 2-2. Analog vs Digital Transmissions

Buttons, Indicators, & Status Lights

Right knob on top:
The knob on top of the radio functions as an on/off switch (turn CW click = radio turns on & turn CCW click = radio turns off). The knob also adjusts the volume of the radio. Continuously turning the knob CW will increase the device's volume, and turning it CCW will turn the volume down. Important to note that you can adjust the volume of the device to zero without turning on silent mode. This is accomplished by turning the knob CW enough to hear the audible click that the radio is on, but not any further.

Central knob on top:
Turning CCW: decreases frequency by .00250 MHz/ 2.5KHz or decreases channel by 1
Turning CW: Increases frequency by .00250 MHz/ 2.5KHz or increases channel by 1

Home/Back Button:

After the operator makes a software change within the device, they can continuously press the back ( ) / home( ) button to arrive back to the starting screen.

P1 & P2 Buttons:
A short press of the P2 button changes between the channel and frequency mode when on the starting screen. When in settings it can also be used as an alternative to pressing the back( )/home( ) button, as the P2 button only requires one click to arrive back to the starting screen. A long press of the P2 button is supposed to lock or unlock the keypad, but this feature is inoperable. There will be an audible beep, but no functionality will change. A short press of the P1 will, by default, recite the battery's level. A long press of the button will go to the Contacts page. Both the P1 and P2 buttons can be altered in the device settings, through the following file path: Menu > Settings > Radio Settings > Key Func
The possibility of shortcuts that can be programmed is not covered in this manual.

Status Lights:
The light between the center and right knob on the top of the radio denotes transmission status. This light will be located by number 3 on the Figure 2-1.

- A solid red light: transmitting (Push-to-Talk)
- A blinking red light: not used
- A solid green light: receiving a signal
- A blinking green light: scanning

Chapter 3. Power and Battery

Battery Installation, Removal, Charging, and Care

Battery Installation

1. Gently slide the battery up from the bottom of the radio, until the battery contacts align and make contact with the radio's battery terminals.
2. Make sure that the battery slides *parallel* to the radio to ensure contacts line up.
3. Once both are in contact, use the flat-head screwdriver that came with the device to screw the screw into the radio's housing.
4. Tighten the screw only enough to secure the battery in place. *Do not overtighten*, as this could damage the threads or crack the housing.

Battery Removal

1. Use the flat-head screwdriver that comes with the radio to unscrew the screw on the bottom of the device.
2. Once the screw is no longer attached to the battery, gently slide the battery out of the radio.

Charging:

Charging can be done either through the USB-C port located on the back bottom of the radio. If charging through the USB-C cable, the light surrounding the port will signify the state of charge. The light surrounding the port will be green when the device is charged, and red when the device is not charged. The radio can also be charged using the cradle dock that is provided with the radio. The colors on the front of the cradle dock have the same color symbolism as the light around the USB-C port.

Charge times are calculated using the manufacturer's included power adapter rated for 5 W

- 3 hours to charge the 2500 mAh battery to 100%.
- 4.5 hours to charge the 3500 mAh battery to 100%.

Use only the manufacturer's included 5 W power adapter for charging the radio. Use of a different adapter may result in increased temperature of internal components potentially causing damage of the more sensitive components such as the battery, charging integrated circuit (IC), or protection circuitry.

For the radio to audibly inform the operator on the battery's state, press P1. The radio will inform the user with one of the following messages: battery high, battery medium, or battery low.

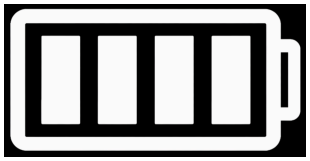
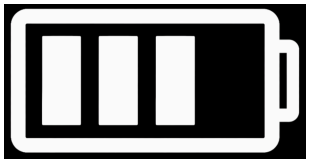
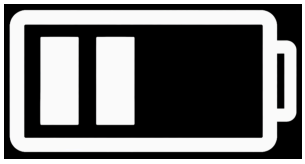
Number of Bars	Battery Icon	Battery Level	Remaining Operational Time (hr:min)
4		Battery high	24:00
3		Battery high	18:00
2		Battery medium	12:00
1		Battery low	6:00

Table 3-1. Battery Levels

Battery Care:

It is important to ensure that the radio is in a climate-controlled environment. The battery is even more sensitive to temperature changes, relative humidity, and other weather conditions. The battery's operating temperature is 5℃ - 40℃ (40˚F - 105˚F), which is a narrower range than that of the radio: -10℃ - 55℃ (15°F - 130°F)

Chapter 4. Getting Started and Basic Operation

Powering On and Off

The knob is located in the top-right position of the radio.

Turn on: rotate the knob clockwise (CW). Note that the radio will display the voltage that it is currently operating at. That voltage is dependent on the state of charge of the battery.

Turn off: rotate the knob counterclockwise (CCW). When operation is completed, the screen will display the message “Powering down…” for a quarter of a second, then the screen will go black

Switching Between Modes

Channel & Frequency:

Switch between frequency and channel mode by performing a short press of the P2 button on the front of the radio. It should be noted that Channel is spelled Channe1. The appearance of both modes can be found in Figure 4-1 below.

Figure 4-1. Channel and Frequency Mode

Analog & Digital:

Switch between analog and digital by pressing the back( )/home( ) button.

Additional Modes:

Adjusting the display brightness Menu > Settings > Radio Settings > Display Func > Back Light > Select between the 6 Brightness options: 1-6

When operating in contested environments, it’s ideal to reduce your audible signature. This can be done on the radio through Menu > Settings > Radio Settings > Voice Function > Radio Silent > down arrow to

select ON by clicking the OK button. This will stop all sound from being emitted by the device, including transmissions on the frequency you are operating at.

Chapter 5. Antenna and Signal Basics

Antenna Overview

Handheld radio antennas are compact, portable antennas designed for VHF/UHF transceivers that enable wireless transmission and reception of signals. Antennas come in various types such as rubber ducky, stubby, whip, and telescoping being the most popular. Due to the variety of antennas, it's important to know what frequencies your antenna can operate on. To find out what frequencies your antenna operates on, look at the base or port of the antenna.

For example, this antenna has frequency coverage in the VHF band of 136 - 174 MHz and in the UHF band of 400 - 500 MHz.

Figure 5-1. One of the Possible Antennas that can be Shipped with Radio

Antenna Profile: flexible handle radio antenna used for everyday portable communication because it is durable, compact, and easy to carry

Figure 5-2. Rubber Ducky Antenna

Antenna Profile: long, flexible antenna used to improve signal range and reception on portable or mobile radios

Figure 5-3. Whip Antenna

Antenna profile: can be extended or shortened to adjust its length for better performance on different frequencies and operating conditions

Figure 5-4. Telescopic Antenna

Antenna profile: is a short, low-profile antenna used when convenience and portability matter more than maximum range

Figure 5-5. Stubby Antenna

Antenna Installation:

1. Ensure that the antenna uses an SMA-Female compatible antenna, which has a small threaded metal collar with a hollow center socket designed to screw onto the radio's connector.
2. Align the antenna connector with a radio's antenna port
3. Gently place the antenna onto the connector and begin turning it clockwise by hand
4. Continue tightening until it is snug, but do not overtighten to avoid damaging the connector
5. Ensure the antenna is straight and secure before turning on the radio and transmitting, since transmitting without an antenna can reflect power back into the radio and potentially damage the transmitter

Signal Range Factors

Power Output:

Transmitter power output serves as the primary adjustable factor for extending a radio's communication range. By increasing the transmission's power output to a higher wattage, the affected radiated power is able to compensate for losses caused by frequency, humidity, or terrain. In practice, each doubling of transmitter power provides approximately 3 dB of additional signal strength, extending the usable distance. See range tables below for more information.

Terrain, Urban vs. Rural Use, & Line-of-sight:

Terrain has a large impact on the radio's signal propagation distance. Higher operating frequencies experience greater attenuation over uneven ground compared to lower frequencies, while transmitter power output determines how effectively the signal overcomes elevation changes and surface irregularities before falling below usable strength. Relative humidity can further increase atmospheric

absorption, which is common when transmitting from a position lower relative to the surrounding environment: valley, ravine, etc.

The density of both structures and electronic transmitting devices has an impact on signal strength. Other devices operating at close proximity can drown out the radio's signal, making it difficult to receive a message. Buildings also play a role in determining propagation. Radio waves have a difficult time permeating through structures, instead they bounce off surfaces, reducing their strength.

Line of sight (LOS) governs most radio transmissions. Due to the frequencies in which the radio operates, UHF & VHF, the radio waves cannot rely on ionospheric propagation due to their small wavelength. If the person receiving transmission is not only in line of sight but also visible, there is a high likelihood that the message will be received, despite the large distance between the two parties.

VHF Band (2 m / 136-148 MHz)			**UHF Band (70 cm / 433-449 MHz)**		
Wattage Output	**Theoretical Range**	**Realistic Range**	**Wattage Output**	**Theoretical Range**	**Realistic Range**
High: 7.35-8.34 W	20-30 mi (32-48 km)	5-1 mi (8-24 km)	High 8.69-8.86 W	15-25 mi (24-40 km)	3 -10 mi (5-16 km)
Mid: 4.65 - 6.3 W	15-25 mi (24-40 km)	4-12 mi (6-19 km)	Mid 4.93 - 6.19 W	12-20 mi (19-32 km)	2-8 mi (3-13 km)
Low: 2.7-3.15 W	10-18 mi (16-29 km)	3-8 mi (5-13 km)	Low 2.1-2.6 W	8-15 mi (13-24 km)	1-5 mi (2-8 km)

Table 5-1. VHF & UHF Table

Chapter 6. Channels, Frequencies, Programming Basics

Frequency Information

VHF & UHF:
[See Antenna Frequency Coverage in Chapter 5 & Frequency ranges below.]

Legal Frequencies to Use:
Detail which frequencies can be transmitted depending on the license type: GMRS, FRS, business band. This is not a comprehensive list of frequencies that the radio can operate at. There are many frequency ranges such as the FRS (462.5625 MHz – 467.7250 MHz) and MURS (151.820 MHz – 154.600 MHz) that the radio is capable of transmitting on, but not legally, due to the design of the radio.

General Mobile Radio Service (GMRS)				Family Radio Service (FRS)			Multi-Use Radio Service (MURS)	
Channel	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Bandwidth (KHz)**
1	462.5625	5	20	462.5625	2	12.5	151.820	11.25
2	462.5875	5	20	462.5875	2	12.5	151.880	11.25
3	462.6125	5	20	462.6125	2	12.5	151.940	11.25
4	462.6375	5	20	462.6375	2	12.5	154.570	20.00
5	462.6625	5	20	462.6625	2	12.5	154.600	20.00
6	462.6875	5	20	462.6875	2	12.5		
7	462.7125	5	20	462.7125	2	12.5		
8	467.5625	0.5	12.5	467.5625	0.5	12.5		
9	467.5875	0.5	12.5	467.5875	0.5	12.5		
10	467.6125	0.5	12.5	467.6125	0.5	12.5		
11	467.6375	0.5	12.5	467.6375	0.5	12.5		
12	467.6625	0.5	12.5	467.6625	0.5	12.5		
13	467.6875	0.5	12.5	467.6875	0.5	12.5		
14	467.7125	0.5	12.5	467.7125	0.5	12.5		

General Mobile Radio Service (GMRS)				Family Radio Service (FRS)			Multi-Use Radio Service (MURS)	
Channel	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Bandwidth (KHz)**
15	462.5500	50: mobile stations 15: fixed stations	20	462.5500	2	12.5		
16	462.5750	50: mobile stations 15: fixed stations	20	462.5750	2	12.5		
17	462.6000	50: mobile stations 15: fixed stations	20	462.6000	2	12.5		
18	462.6250	50: mobile stations 15: fixed stations	20	462.6250	2	12.5		
19	462.6500	50: mobile stations 15: fixed stations	20	462.6500	2	12.5		
20	462.6750	50: mobile stations 15: fixed stations	20	462.6750	2	12.5		
21	462.7000	50: mobile stations 15: fixed stations	20	462.7000	2	12.5		

General Mobile Radio Service (GMRS)				Family Radio Service (FRS)			Multi-Use Radio Service (MURS)	
Channel	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Bandwidth (KHz)**
22	462.7250	50: mobile stations 15: fixed stations	20	462.7250	2	12.5		
23	467.5500	50: mobile stations 15: fixed stations	20					
24	467.5750	50: mobile stations 15: fixed stations	20					
25	467.6000	50: mobile stations 15: fixed stations	20					
26	467.6250	50: mobile stations 15: fixed stations	20					
27	467.6500	50: mobile stations 15: fixed stations	20					
28	467.6750	50: mobile stations 15: fixed stations	20					

General Mobile Radio Service (GMRS)				Family Radio Service (FRS)			Multi-Use Radio Service (MURS)	
Channel	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Max Power (W)**	**Bandwidth (KHz)**	**Frequency (MHz)**	**Bandwidth (KHz)**
29	467.7000	50: mobile stations 15: fixed stations	20					
30	467.7250	50: mobile stations 15: fixed stations	20					

Table 6-1. Legal Frequencies

General Mobile Radio Service (GMRS) and Family Radio Service (FRS) share the same 22 FRS channel frequencies, but GMRS also includes 8 additional 467 MHz main channels that FRS does not use.

Business-band radios are licensed under FCC Part 90 and are commonly used in the VHF and UHF land-mobile bands, especially 150-174 MHz and 421-512 MHz, with many systems assigned in the 450-470 MHz and 470-512 MHz ranges. Because the FCC narrowed these systems, new or modified Part 90 VHF/UHF equipment is generally limited to 12.5 kHz or 6.25 kHz channel efficiency rather than the old25 kHz wideband operation, and the authorized power is not one fixed value because the FCC limits stations to a minimum power needed and sets Effective Radiated Power (ERP) by band and station type.

There is no universal channel count for business bands; channels are assigned by license and frequency coordination, so one system may have only a few channels while another may have many. For 2026, an application fee is about $65-$140 plus frequency coordination, which usually costs about $100-$400. The total cost is commonly around $300-$800 for a 10-year license covering multiple radios.

Channel and Memory Basics

Channel Naming:
The radio allows for saving any frequency within antenna range bands to a maximum of 16 characters. Those characters include uppercase and lowercase letters and the numbers 0-9. To toggle between uppercase and lowercase, press the #/up arrow located at the bottom right of the key pad.

Memory Channels:
The device allows up to a total of 4000 memory channels to be saved. Those channels can also be added using Baofeng's proprietary programming software available at the link:
https://www.baofengradio.com/pages/download
Instructions on how to program channels through the software are not included in this manual.

Saving Channels:
Enter the frequency you wish to save on the starting screen > Menu > Settings > Channel Set > VFO Save to CH > Enter what you wish the Channel Name to be > click OK

Frequency Entry

VFO Frequency Entry:
Frequencies can be entered in the device to allow for reception on that set frequency by typing the frequency. With a precision of .00001 MHz, there are up to 8 digits that can be entered into the device. Note that the operator does not need to type zeros for the digits as they can press OK. For example, setting the radio to frequency 151.82000 MHz, can be done by pressing 1,5,2,8,2, and then pressing the OK button located on the keypad. Note that frequencies can also be changed using the center knob located on the top of the radio. There are two other ways to reach the same frequency: either pressing the up or down symbols on the keypad or turning the knob located on the top of the radio. Pushing the up arrow or

turning the knob clockwise will increase the reception frequency by 0.0025 MHz or 2.5 KHz. Pushing the down arrow or turning the knob counterclockwise will result in the opposite.

Channel Mode Selection:
Channel mode can be changed using the same keys used for the VFO frequency entry. Additionally, the use of the knob or up and down arrows can alter the reception frequency the same way. The only difference when turning the knob or using the arrows is the unit, which would be channel number, with the amount being 1 unit for each operation.

Additional Frequency Information

Frequency List Websites:
The following websites allow you to view what frequencies are in use by various government agencies. The operator should download or print these off.

FCC License Lookup
https://wireless2.fcc.gov/UlsApp/UlsSearch/searchLicense.jsp

The FCC's website will allow an operator to acquire the permit necessary to transmit on the GMRS. While it is true that you can operate the handheld radio without a license in the case of an emergency, the operator will want to have the training prior to using the radio to ensure effective transmission of information.

Local Frequencies (MHz Range)
https://www.radioreference.com/db/browse/

This website is likely the most useful out of all the provided links depending on the area of operations. The website provides government and business frequencies that are in use. These frequencies can include agencies such as the police, fire dispatch, public works, EMS dispatch. While some frequencies are more likely to be encrypted than others, namely the police department, many are unencrypted allowing for operators to continuously listen to and be alerted to threats before they appear in the news.

National Weather Radio (NWR) Station Listing
https://www.weather.gov/nwr/station_listing

This website provides information on the 7 channels that NOAA operates on. It lists all of the Weather Forecast Office (WFO) and the status of their transmitters to provide information on which ones are in operation. This will allow for an idea of which frequencies are in use, and where the signal is originating from.

Radio Locator (AM & FM Range)
https://radio-locator.com/

This website provides information on what FM and AM radio stations are in operation depending on your area. You are able to search by city or zip code, and receive the list of transmitters. These transmitters include valuable information such as call sign, frequency, Dist./Signal, and format. The format is the most important, and the one that should be written down in case of emergency as the operator will be able to receive news about the surrounding area.

NOAA Frequencies:

Click */ at the bottom left of the radio's front facing keypad. Go through all 7 channels by twisting the center knob on the top of the radio. You can also just type in the frequency using the keypad, and clicking OK to select.

The National Oceanic and Atmospheric Administration broadcasts continuous NOAA Weather Radio transmission on 7 analog VHF frequencies. Each frequency carries the same type of broadcast content, but different transmitters use different channels depending on location. The 7 frequencies in operation are 162.400 MHz, 162.425 MHz, 162.450 MHz, 162.475 MHz, 162.500 MHz, 162.525 MHz, and 162.550 MHz. Typically only a few of these frequencies are active in a given area. This helps ensure overlapping coverage while maintaining geographically specific weather information

The typical information relayed over these frequencies includes:

1. Hourly observations
2. The time and frequency
3. Weather information for the local area
4. The radio tower the signal is transmitted from
5. Temperature, pressure, relative humidity, wind direction and speed, and dew point
6. An extended outlook up to six days from the current day

After completing the broadcast cycle, the transmission repeats from the beginning and continuously loops. The broadcast on average repeats transmission every 4.5 minutes, but can vary based on weather conditions.

Chapter 7. Transmission and Reception

Transmission

Push-to-Talk:
The Push-to-Talk (PTT) button, located on the left upper side of the radio, is used to transmit messages. A cautionary note should be understood that you may accidentally be transmitting. To prevent this, the operator needs to be aware of what the PTT button may be coming in contact with. When placed within a plate carrier, ensure that the radio is the only object within the pouch. When in operation in contested environments, accidental transmission can lead to the enemy direction finding your location. Keep length of transmission and power level to a minimum if this concern is present.

Speaking Technique:
When using the PTT, it is crucial that the entire message is received by all parties involved. By doing so, the operator holds down the PTT, waits half a second, and then transmits the message to ensure that it can be received in its entirety. After completing the transmission, release the PTT button to avoid unintended broadcasts.

Use of the Phonetic Alphabet and Numbers:
The phonetic alphabet should be used to spell out letters clearly, and the phonetic numbers should be used to pronounce each digit. This practice improves clarity and reduces the likelihood of misunderstanding between operators. Below are examples of how the phonetic alphabet and numbers are used:

Message	Transmission
K4ABC	Kilo Four Alpha Bravo Charlie
S3T9	Sierra Three Tango Niner

Power Level Selection:
Use the lowest power setting that still delivers your message clearly in order to reduce the transmission signature and conserve battery life on the device. Battery charge level directly determines the available wattage output and therefore affects the effective communication range under all conditions.

SMS Communication:
Short Message Service (SMS)
Menu > SMS

Accessing Inbox: Menu > SMS > InBox
Accessing Outbox: Menu > SMS OutBox

The handheld radio allows for up to 128-character messages to be sent between devices.

Quick text options:

A. How are you?
B. Nice to meet you
C. How have you been
D. Are you making progress
E. How do you feel today?

The device that sends the message will always receive “msg send fail” even if the message goes through:

Scanning

In radio reception, scanning is an automated process in which a receiver rapidly cycles through a programmed list of frequencies or a selected range, starting at the lowest frequency and increasing until it detects an active transmission. Scans will continue unless the operator presses the back(⮌)/home(⌂) button. The operator is only permitted to scan one range at a time either UHF or VHF, but the operator can have two radios going at the same time to hear both frequency ranges if necessary.

Instructions work for both digital and analog scanning
Scan On: Menu > Scan > Scan Switch > On
Scan Off: Menu > Scan > Scan Switch > Off
Adjusting Scanning Modes: Menu > Scan > VFO Scan Mode > scroll up and down using arrows and click OK on preferred mode

Operations

Time Operation (TO):& Carrier Operation:
In this mode, the radio stops on an active signal for 5 seconds, then resumes scanning automatically even if the transmission is ongoing. It is useful when the operator wants to understand what frequencies are in operation, not necessarily what is being transmitted.

Carrier Operation (CO):
In this mode, the scan stops on an active and stays there until the signal has disappeared, then begins scanning again. The radio interprets 2 seconds without transmission as the signal having ended. This feature is useful when the operator wants to listen to an entire conversation before moving to the next active channel.

Search Operation (SE):
In this mode, the scan stops on an active and stays there on the active signal and will not resume scanning automatically. This is useful when the operator wants to control how long they receive transmission for each frequency in operation.

Scan Behavior & Range Limits

Amateur radio activity is typically highest when operators are off work and propagation conditions are favorable. Activity is generally greatest on weekends, with moderate to high activity during weekday evenings and lower activity during weekday daytime hours. By time of day, early morning (0600-0900 local) often sees increased RF activity, midday (1100-1400 local) typically has moderate activity, and evening hours (1700-2200 local) represent the peak operating period. Activity usually decreases after 2200 local, with reduced but occasional operation continuing into late night hours.

VHF scan range is 136-174 MHz. Takes an average of 20 minutes to scan through entire range
UHF scan range is 400-480 MHz. takes an average of 50 minutes to scan through the entire range.
It's important to note that the time to scan through each scan range limit greatly depends on frequency traffic and scan mode selected.

Repeaters

Repeaters are not covered in this manual. Please seek the following resources to learn more about them if desired: https://hamradioprep.com/how-to-use-ham-radio-repeaters-step-by-step-guide/

Chapter 8. Digital Features and Messaging

DMR ID

DMR IDs are identification numbers that the operator can select between 1-7 digits.

How to access: Menu > Settings > Device Info > Device Info
How to change an existing DMR ID: Menu > Settings > Device Info > Channel Set > DMR ID > Select one of the five radios to assign it to: Radio 1,2,3,4,5 > Change either Edit ID or Edit Name and click save when you are finished
How to insert a new DMR ID: Menu > Talk Group > New Contact > Enter other Radio's Private ID

Entering another radio's DMR ID into the radio's contacts will allow the operator to view the name of the radio the message is originating from. This only works for digital communication. Even if you have the DMR ID of the radio that is transmitting a signal that you are receiving, you will not be able to discern the name of the source. Keep in mind that it is not required to put the other radio's contact information into yours to be able to send a message as you can perform a Manual Dial instead of Search Contact after a message is written out

Encryption

The radio supports encryption, denoted by the symbol in figure below.

Figure 8-1. Encryption Symbol

Encryption allows your transmission to be obfuscated so that only radios with that specific encryption standard can understand the message. This does not prevent the transmission of your message from being triangulated. Keep in mind that encryption is only supported in digital mode. See figure 10-1 for the location of the encryption symbol if activated.

Encryption Menu & Levels:
Menu > Settings > Channel Set > Digit Encrypt

Turning on encryption: > Encrypt List > Select one of the following settings None, Encrypt 1, Encrypt 2, Encrypt 3, and Encrypt 4 > Encrypt Switch > ON
Despite the device only supporting 4 encryption modes, operators are able to set their own encryption keys following certain protocols (ARC4, AES-128, & AES-256) through Baofeng's proprietary programming software (not covered in this manual). While the radio does support those 4 encryption modes without using programming software, there is no information on the encryption standard, leading to the advice to not trust that the information being transmitted through those encryption levels is secure against interception or suitable for sensitive communication .

Legal Notes:
[See Chapter 1 Legal and Licensing Notes.]

Chapter 9. GNSS and Location Features

GNSS Overview

GNSS is the umbrella term for satellite systems that broadcast positioning, navigation and timing signals to receivers. GPS is a U.S. GNSS, and BDS (BeiDou Navigation Satellite System) is China's GNSS. GPS consists of 31 operational satellites with an accuracy of 8 m horizontal and 13 m vertical with global average coverage of 95%; BDS consists of 66 operational satellites with an accuracy of 10 m horizontal and 10 m vertical with an average coverage of 95%. Use of both of these satellite systems will ensure redundancy and increased accuracy in receiving GNSS information.

Access GNSS information: Menu > GNSS > GNSS Info

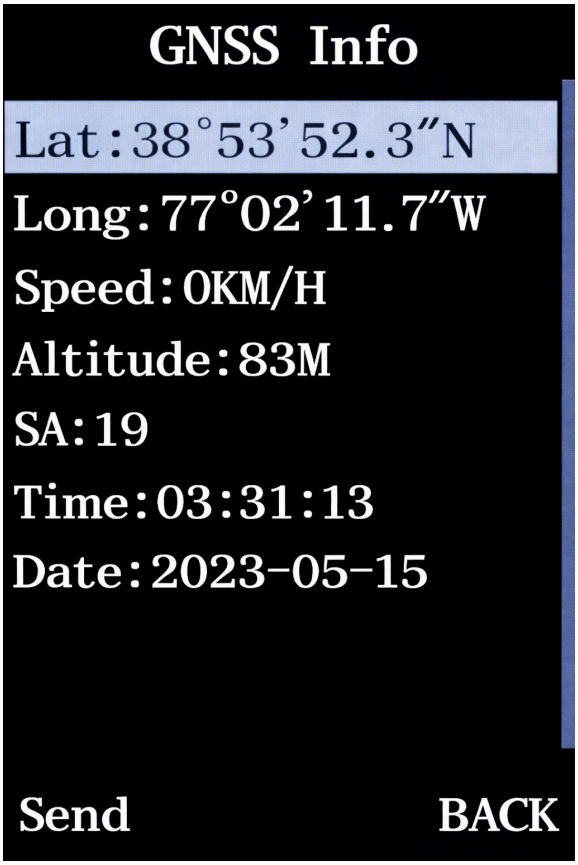


Figure 9-1. GNSS Info

The accuracy of this data is satellite dependent. Some satellites will grossly underestimate or overestimate the altitude. The accuracy of the latitude and longitude is rather poor. The precision of the latitude is 2.5 m, and the longitude is 3.09 m, based on .1-arcsecond level displayed.

The date information will either be displayed in year-month-day format or day-month-year format.

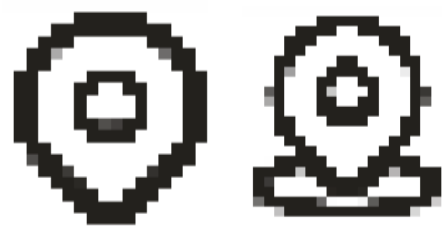


Figure 9-2. GNSS Symbols

When GNSS is turned on, you will see this symbol - a teardrop shape - on the top left of the face of the radio. When the radio is locked onto a satellite, that teardrop shape will have a circle underneath it.

Toggle On: Menu > GNSS > GNSS On/Off > scroll up and down using arrows to select a mode and click OK

Adjusting GNSS Mode: Menu > GNSS > GNSS Mode > Scroll up and down using arrows to arrive at GPS, BDS, or GPS + BDS, and click OK when wanted mode is selected

Toggle Off: Menu > GNSS > GNSS On/Off >scroll up and down using arrows to select a mode and click OK

Chapter 10. Troubleshooting, Maintenance, and Reference

Symptom	Possible Cause	Corrective action
Radio does not turn on	Battery pack not installed correctly; battery discharged; contacts dirty	Remove the battery pack and reinstall it securely. Charge or replace the battery. Clean the battery and radio contacts if needed
Display is blank or very dim	Power is off; brightness is set low; battery is low	Turn the radio on. Increase the backlight or display brightness. Recharge the battery.
Radio turns on but no audio is heard	Volume is too low; squelch is set too high; wrong channel or mode selected	Increase the volume. Reduce squelch setting if applicable. Confirm the correct channel, frequency, and analog/digital mode.
Cannot transmit	PTT not pressed firmly; battery low; channel busy; transmit disabled on the current channel	Press and hold PTT while speaking. Recharge the battery. Check whether the selected channel allows transmission.
Other stations cannot hear you	Microphone blocked; low battery; wrong transmit frequency or tone; wrong digital settings	Speak clearly into the microphone. Confirm the transmit frequency CTCSS/DCS tone, color code, talk group, and contact settings match the system in use.
Audio is distorted or unclear	Microphone too close or too far from mouth; signal is weak; volume too high	Hold the radio 2 to 5 cm from your mouth and speak normally. Move to a location with a better signal. Lower the volume if the received audio is distorted.
Range is poor	Obstructions; low battery; wrong power level; antenna not fully attached	Move to a higher or clearer location. Use a higher power setting if permitted. Check the antenna is secure. Recharge the battery.
Radio stops on unwanted signals	Squelch setting too low; scanning settings too sensitive; nearby interference	Adjust squelch and confirm the scan list or channel list is correct. Move away from sources of interference.
Scanning does not stop on active channels	Scan list not programmed; scan mode set incorrectly; signal too weak	Confirm the desired channels are included in the scan list. Check scan mode settings. Move closer to the transmitting station

Figure 10-1. Troubleshooting Table

Additional Notes:

- If the radio becomes unresponsive, power it off and on again.
- If a channel works poorly, compare it with a known good radio on the same channel.
- Poor performance may be caused by antenna type, terrain, building construction, or interference from nearby devices (particularly common in highly populated areas)

When to Seek Service:

Cease operation of the radio and seek service if any of the following occur:

- The battery overheats, swells, leaks, or smells unusual.
- The radio becomes excessively hot during normal use.
- The radio has been dropped, submerged, or physically damaged.
- The radio still fails to operate correctly after basic troubleshooting.

Maintenance:
Follow these steps to ensure the radio can reliably operate when needed most:

- Store the battery separately from the device if not used for prolonged periods of time (months)
- Depending on climate, regularly check and clean the battery and charge contacts with a dry cloth to prevent charging failures
- On a monthly basis, check the charge of your batteries. It is important to store them in a cool, dry place (15–20 °C / 59–68 °F) at roughly 50% level.
- Inspect and tighten the antenna before every use; replace if damaged to avoid harm to the device.

Time

Menu > Settings > Radio Settings > Display Func > Time Set

Figure 10-2. Starting Screen

Time information is located in the lower center of the device. It includes both the year/month/day as well as the time of day in hours:minutes. The operator can change the display format between year/month/day or day/month/year.

Time Zones:

Menu > GNSS > Time Zone > Scroll up or down until you reach the appropriate time difference and click OK

Figure 10-2. Standard Time Zones of the World

When the handheld radio is connected to a GNSS satellite, the time will be displayed on the starting screen as shown by Figure 10-1. To ensure that the hour is correct for your location, select the correct Coordinated Universal Time (UTC) + or - depending on your location in the world. Note that this will be different depending on the time of the year. For example, for EST (standard time), the UTC should be -5 hours, but during EDT (daylight saving), the UTC should be -4 hours.

Frequency vs Wavelength

Frequency	Wavelength	Description
30 GHZ - 300 GHZ	1 MM - 10 MM	EXTREMELY HIGH FREQUENCY (EHF)
3 GHZ - 30 GHZ	1 CM - 10 CM	SUPER HIGH FREQUENCY (SHF)
300 MHZ - 3 GHZ	10 CM - 1 M	ULTRA HIGH FREQUENCY (UHF)
30 MHZ - 300 MHZ	1 M - 10 M	VERY HIGH FREQUENCY (VHF)
3 MHZ - 30 MHZ	10 M - 100 M	HIGH FREQUENCY (HF)
300 KHZ- 3 MHZ	100 M - 1 KM	MEDIUM FREQUENCY (MF)
30 KHZ - 300 KHZ	1 KM - 10 KM	LOW FREQUENCY (LF)
3 KHZ - 30KHZ	10 KM - 100 KM	VERY LOW FREQUENCY (VLF)
300 HZ - 3 KHZ	100 KM - 1,000 KM	ULTRA LOW FREQUENCY (ULF)
30 HZ - 300 HZ	1,000 KM - 10,000 KM	SUPER LOW FREQUENCY (SLF)
3 HZ - 30 HZ	10,000 KM - 100,000 KM	EXTREMELY LOW FREQUENCY (ELF)

Glossary

AES: Advanced Encryption Standard
AM: Amplitude Modulation
APRS: Automatic Packet Reporting System
BDS: BeiDou Navigation Satellite System
CCW: Counterclockwise
CO: Carrier Operation
CW: Clockwise
DMR: Digital Mobile Radio
EMS: Emergency Management Services
FCC: Federal Communications Commission
FM: Frequency Modulation
FRS: Family Radio Service
GMRS: General Mobile Radio Service
GNSS: Global Navigation Satellite System
GPS: Global Positioning System
HT: Handheld Transceiver
ID: Identification
KHz: Kilohertz
LOS: Line of Sight
MHz: Megahertz
MURS: Multi-Use Radio Service
NOAA: National Oceanic and Atmospheric Administration
PTT: Push-to-Talk
RF: Radio Frequency
RX: ReceiveSE: Search Operation
TM: Technical Manual
TO: Time Operation
TX: Transmit
UHF: Ultra High Frequency (300–300 MHz Band)
UTC: Coordinated Universal Time
VFO: Variable Frequency Oscillator
VHF: Very High Frequency (30–300 MHz Band)
W: Watts
WFO: Weather Forecast Office

Phonetic Alphabet and Numbers

Alphabet

Letter	Word	Pronunciation
A	ALFA	AL FAH
B	BRAVO	BRAH VOH
C	CHARLIE	CHAR LEE
D	DELTA	DELL TAH
E	ECHO	ECK OH
F	FOXTROT	FOKS TROT
G	GOLF	GOLF
H	HOTEL	HOH TEL
I	INDIA	IN DEE AH
J	JULIETT	JEW LEE ETT
K	KILO	KEY LOH
L	LIMA	LEE MAH
M	MIKE	MIKE
N	NOVEMBER	NOVEMBER
O	OSCAR	OSS CAH
P	PAPA	PAH PAH
Q	QUEBEC	KEH BECK
R	ROMEO	ROW ME OH
S	SIERRA	SEE AIR RAH
T	TANGO	TANG GO

Letter	Word	Pronunciation
U	UNIFORM	YOU NEE FORM
V	VICTOR	VIK TAH
W	WHISKEY	WISS KEY
X	XRAY	ECKS RAY
Y	YANKEE	YANG KEY
Z	ZULU	ZOO LOO

Numbers

Number	Pronunciation
1	WUN
2	TOO
3	TREE
4	FOW-er
5	FIFE
6	SIX
7	SEV-en
8	AIT
9	NIN-er
0	ZERO

Amateur Radio Logbook

Date: _____ Location: _____ Time Scanning: _____

Time	Frequency	Mode	Callsign	Notes

References

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